

FIG. 1

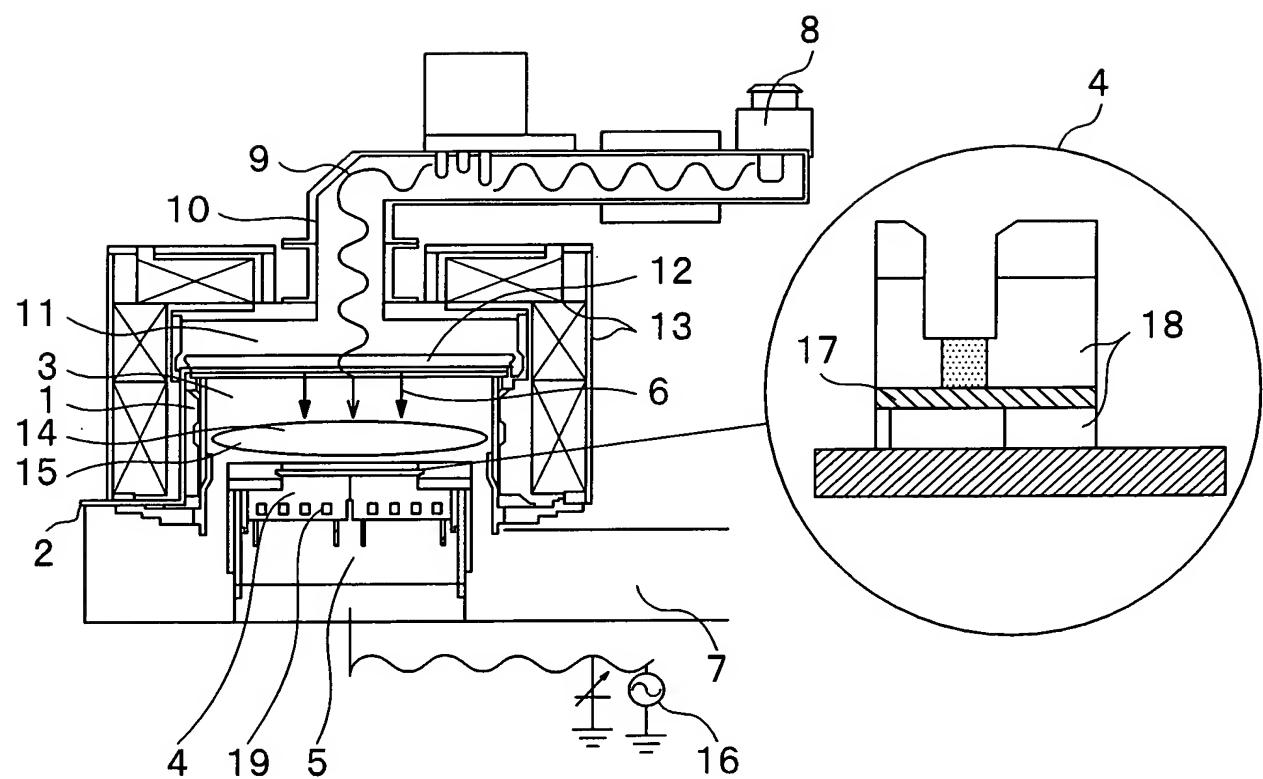


FIG.2

	protecting properties for the low-k film	etching properties against the diffusion prevention film	perpendicularity and controlling properties for the processed pattern	controlling properties for the density and temperature of plasma
large effect	$\text{SO}_2, \text{SO}_3, \text{SOF}_2$	$\text{NF}_3, \text{N}_2\text{F}_4$	$\text{N}_2, \text{NH}_3, \text{NOx}$	increase the electron temperature
	$\text{SO}_2\text{F}_2, \text{SONx}$	NF_3O	N_2O	in the order of He, Ne, Ar, and Xe
	SH_2	SF_4, SF_6		
	$\text{CO}_2, \text{CO}, \text{O}_2$			
	C_3O_2	CF_4		increase the density
			$\text{HCl}, \text{HBr}, \text{HF}$	in the order of Xe, Ar, Ne, and He
small effect	$\text{SiCl}_4, \text{SiBr}_4$		HI	
		HBr	$\text{CHF}_3, \text{CH}_2\text{F}_2$	
	$\text{CxFy} (x/y > 1.5)$			

FIG.3

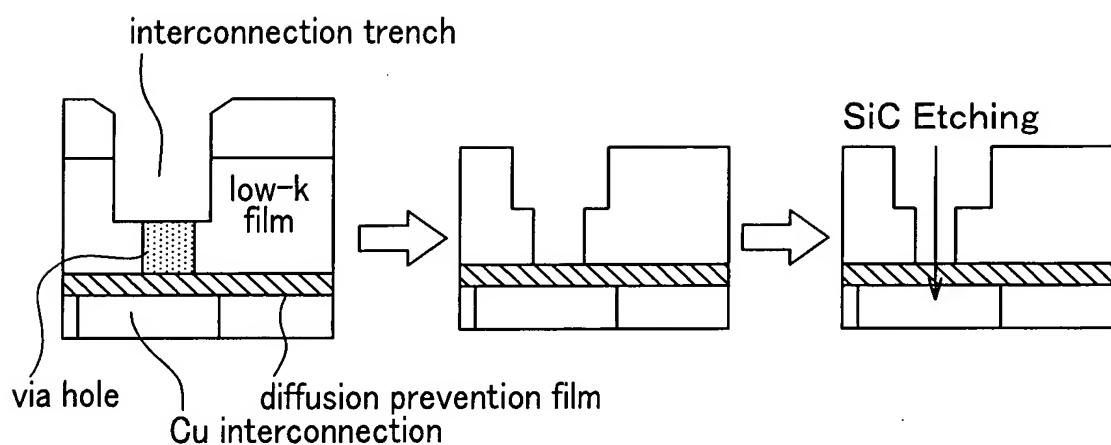


FIG.4

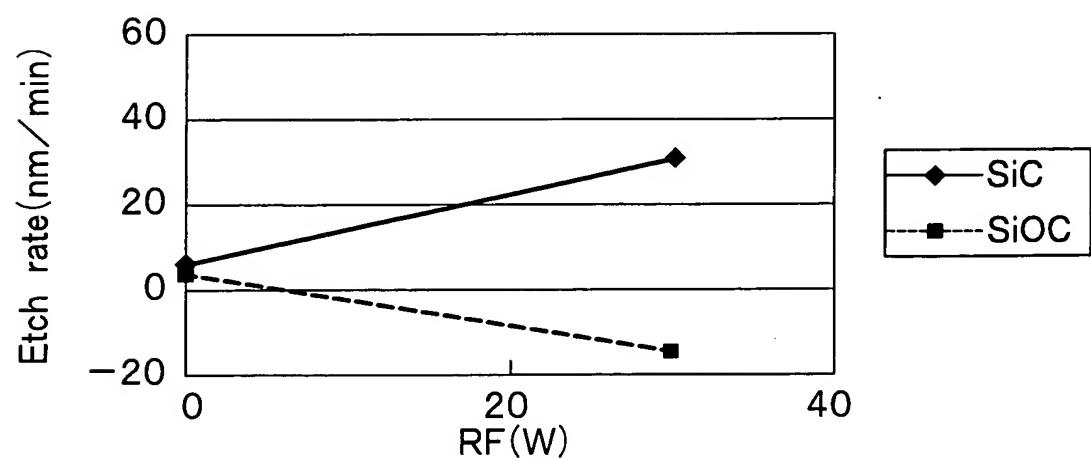


FIG.5

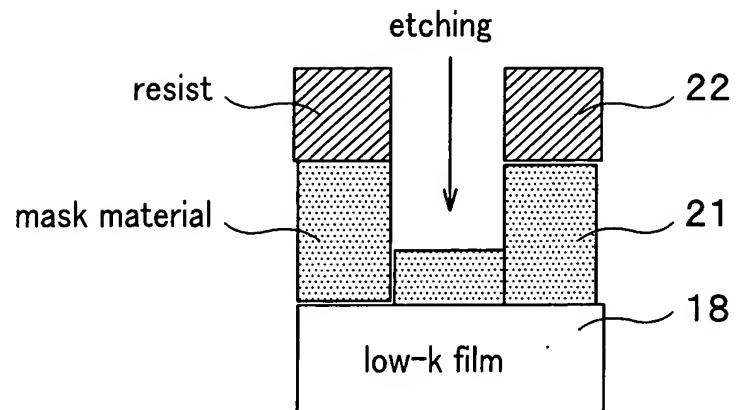


FIG.6

the binding energy between the surface and the product

surface	Si-	C-	O-
product	(eV)	(eV)	(eV)
CF ₄	C:-0.04	-0.29	-0.05
	F:1.01		
CF ₂	2.71	3.01	3.30
CO	0.75	1.02	1.68
CO ₂	C:-0.15	0.12	0.68
	O:0.08	-0.51	0.79
COF ₂	0.2	0.22	0.56
SiF ₄	-0.04	-0.23	0.13
SiCl ₄	-0.39	-0.3	1.04
CCl ₄	1.73	1.09	1.20
SF ₆	1.37	1.89	-0.39
SF ₄	2.74	2.74	3.10
NF ₃	3.52	1.46	0.95
SO ₂	0.95	1.16	1.96
N ₂	-0.01	-0.27	-2.31

FIG. 7

the binding energy between the surface (Si, C, O, N) and the product

product	Si- (eV)	C- (eV)	O- (eV)	N- (eV)
SO ₂	0.95	1.16	1.96	
CO ₂	C:-0.07	-0.33	0.69	0.54
	C:0.28	-0.78		
SiF ₄	-0.1	-0.03	-0.08	0.34
CF ₄	C:-0.04	-0.16	-0.05	-0.01
	F:1.01			
COF ₂	C:0.19	0.25	0.56	0.75
	O:0.92	-0.32		
CNF	C:1.49	1.93	2.34	2.12
	N:1.84	1.21		
CNCI	C:1.18	1.53	1.73	1.68
	N:1.52	0.93		
CNH	C:0.83	1.17	1.5	1.35
	N:0.94	0.46		
CO	0.81	1.07	1.68	1.75
CF ₂	2.71	3.1	3.29	3.26
SiF ₂	1.34	1.98	3.43	2.75
CCl ₄	C:1.73	1.09	1.23	1.13
	Cl:1.75			
SiF ₂ Cl ₂	-0.08	-0.29	0.74	0.49
SiCl ₄	-0.39	-0.4	1.04	0.24
	Cl:0.04			
N ₂	-0.01	-0.27	-2.31	-0.68
NF ₃	3.89	1.28	0.39	0.93
SiF ₂ Br ₂	-0.19	0.03	0.95	0.71
SiBr ₄	-0.25	0.28	1.65	0.49

FIG.8

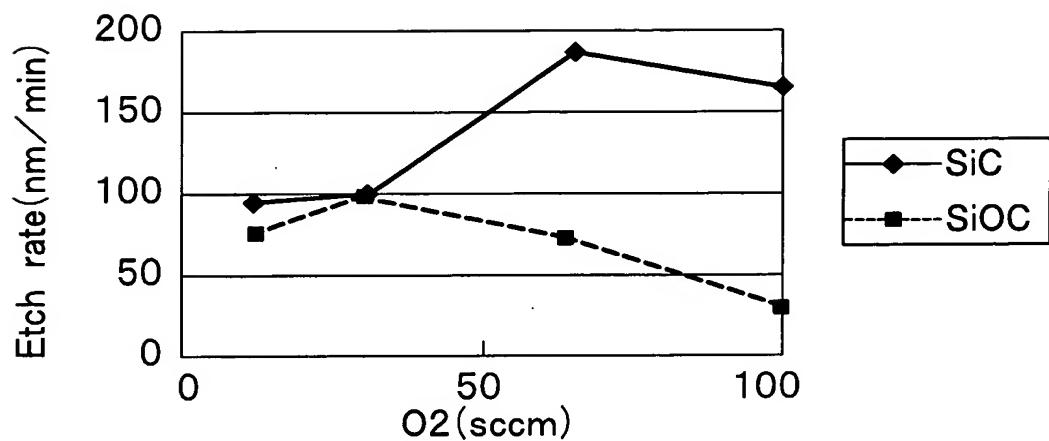


FIG.9

